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visible in the spectra of those which are rich in lines; it is very prominent in the Sun and in some stars of Class IIa, and appears in the spectrum of α *Orionis* (Class IIIa) as one of the strongest lines. In the laboratory this line also shows an opposite behavior to that noted for 448.2^{nm}. It is hardly or not at all visible in the spark spectrum, but very strong and broad in the electric arc spectrum. LIVEING and DEWAR had already noticed the peculiarity of this line.

The favorable circumstance that two lines belonging to the same substance show opposite behavior, is a proof that the phenomena which these lines present on the stars can only be a function of temperature and not of pressure. Increased pressure broadens all lines of a gas and makes them more prominent. It cannot happen, according to KIRCHHOFF's law, that a line becomes smaller with increased pressure. On the contrary, it is a well known fact that single lines may become weaker and smaller at higher temperature, while, generally speaking, the lines become stronger and broader under such conditions. Hence, I feel justified in announcing the following :

The temperature of the so-called absorbing strata—the upper strata of the photosphere—on the stars, Class IIIa, is approximately equal to that of the electric arc (about 3000° to 4000° C.); it is higher on the Sun and the stars of Class IIa, but does not reach the intensity of the spark of a Leyden jar; on the stars of Class Ia it approximates the temperature of this spark (upper limit about 15,000° C.).

This result furnishes at the same time the first direct proof for the correctness of the physical meaning of VOGEL's spectral classification, according to which Class II has been developed by cooling of Class I, and Class III by still further cooling of Class II.

LETTER FROM DR. VEEDER REGARDING THE AURORA OF
FEBRUARY 22, 1894.

“ PROFESSOR E. S. HOLDEN, LICK Observatory, Mount
Hamilton, Cal.

“ *Dear Sir:* You will perhaps be interested to learn that the aurora of February 22 last, which was seen at LICK Observatory and elsewhere in Southern California, New Mexico, Arizona, etc., was not generally seen eastward in the United States until the

following day, when it became conspicuous along the Atlantic coast. Careful inquiry develops the fact that the telegraph lines were disturbed by earth currents westward from Chicago exclusively on February 22; such disturbance not extending eastward until the day following, when the aurora did likewise. This localization of the aurora in longitude is most interesting, and is being actively investigated in connection with the system of concerted observations of the aurora undertaken in co-operation with the expedition of Lieutenant PEARY. The officials of the Western Union Telegraph Company have been interested, and more complete memoranda of the distribution of earth currents on their lines are being made.

"The relations to characteristic solar conditions which I have pointed out in notes and articles heretofore, are being verified most completely. Yours truly, M. A. VEEDER."

LYONS, N. Y., April 30, 1894.

ROTATION OF THE PLANET SATURN.

"The latest important results on this question are due to Mr. STANLEY WILLIAMS,* who has taken every pains for the determination of an accurate value, and to free the results from any possibility of their being influenced by preconceived ideas. With regard to the method of observation employed, and the details of the observations themselves, we must refer the reader to the publication mentioned [in the foot note], but a brief summary of the results may not be out of place.

"The observations were made in 1893, and two kinds of spots were observed: (1) dark spots upon a conspicuous double belt in the northern hemisphere; and (2) bright spots in the equatorial zone.

"In the case of the former, the period was obtained from numerous spots, but eleven of them have been used as giving well-ascertained values, a table of these figures showing that they can be arranged into two classes, the means of which are $10^h 14^m 29^s.07$ and $10^h 15^m 0^s.74$. Between these values there is a difference of over half a minute, a quantity too large, judging from the way sets of observations agree *inter se*, to be due to errors of observations.

"With the bright spots a similar result is noticed, only here

* *Monthly Notices of R. A. Society*, Vol. LIV, No. 5, March, 1894, page 297.